Dell Networking Z9500

High-performance 10/40GbE fabric switch

Industry-leading, high-density 3RU with 132 ports of 40GbE (528 ports of 1/10GbE using breakout cables), low latency, low power and high throughput to ensure line-rate performance, feature-rich Dell Networking Operating System 9, and full L2 switching and L3 routing with rich manageability features.

Dell Active Fabric switch

Z9500 is a compact, next-generation switch/router designed for industry-leading, high-density 10/40GbE aggregation in a data center core network. The Z9500 addresses data center 10/40GE aggregation requirements through traditional hierarchical core or distributed core architectures for high-performance enterprise data centers, high-performance computing (HPC), cloud computing, hyperscale data centers and provider-hosted data centers. As a compact fixed form factor switch, the Z9500 can be positioned as a core, aggregation or end-of-row switch. The Z9500 can support 132 ports of 40GbE QSFP or 528 ports of 1/10GbE SFP+ realized through breakout cables and includes a full suite of Ethernet switching and routing protocols in the hardened Dell Networking Operating System 9 (OS9) to enable layer 2 or layer 3 network architectures. The Z9500 supports a user-friendly pay-as-you-go* pricing model, allowing customers to license 36-, 84- or 132-port SKUs according to their business needs. Pay-as-you-go* pricing can be upgraded to a higher port density with a simple software license.

The Z9500 also supports Dell Networking's Open Automation Framework, which provides advanced network automation and virtualization capabilities for virtual data center environments. The Open Automation Framework is comprised of a suite of inter-related network management tools that can be used together or independently to provide a network that is more flexible, available and manageable while reducing operational expenses. Built-in support for key network virtualization and software defined networking capabilities help enable customers with future-ready agility, optimized for virtual services deployment and delivery.

Key applications

- Active Fabric 10/40GbE switching in enterprise, HPC and cloud computing data centers that require the highest band-width and performance for 1/10GbE servers
- Switching device for non-blocking clos architectures in hyperscale data centers
- High-density 10/40 bE end-of-row switch for blade server aggregation
- Small-scale Active Fabric spine switch along with S-Series 1/10GbE top-of-rack (ToR) switches for cost-effective aggregation of 10/40GbE uplinks

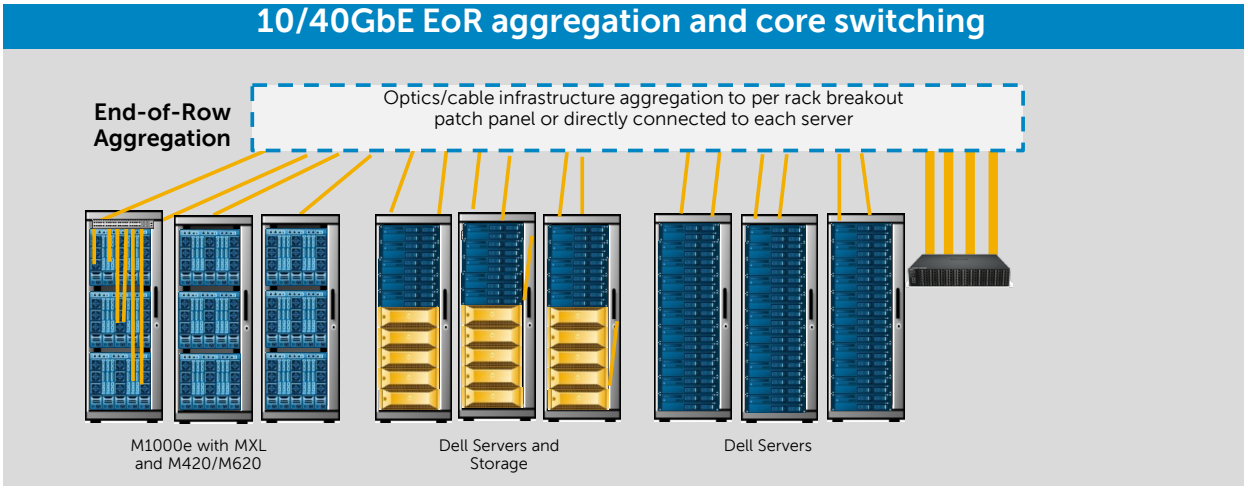
Key features

- 3RU high-density 10/40GbE ToR switch with 132 ports of 40GbE (QSFP+) or 528 ports of 1/10GbE (with breakout cables)
- With 10.4Tbps of switching I/O bandwidth (full-duplex) and available non-blocking switching fabric, the Z9500 delivers line-rate performance under full load with sub-2us latency
- Scalable L2 and L3 Ethernet switching with QoS and a full complement of standards-based IPv4 and IPv6 features, including OSPF and BGP routing support
- I/O panel to PSU airflow
- Open Automation Framework adds automated configuration and provisioning capabilities to simplify the management of network environments
- Modular Dell Networking OS9 software delivers inherent stability as well as advanced monitoring and serviceability functions
- Supports jumbo frames for high-end server connectivity
- 128 link aggregation groups with up to 16 members per group using advanced hashing
- Redundant hot-swappable power supplies and fans
- Low power consumption using a PHY-less design
- Support for L2 multipath using Virtual Link Trunking (VLT)* and mVLT multi-chassis link aggregation technology
- Routed VLT (rVLT)* enables L3 routing protocol support in VLT LAGs and also replaces VRRP L3 gateway at the access layer with scaled L3 VLAN support
- OpenFlow 1.0-ready functionality for SDN* applications
- Tool-less Enterprise ReadyRails™ mounting kits reduce time and resources for switch rack installation
- Power-efficient operation with close to 4W per 1/10GbE port for nominal power consumption

Industry-leading high-density, energy- and deployment-efficient, low latency fabric switch.

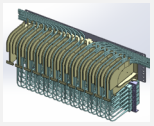
* Post RTS SW release

Aggregation/end-of-row



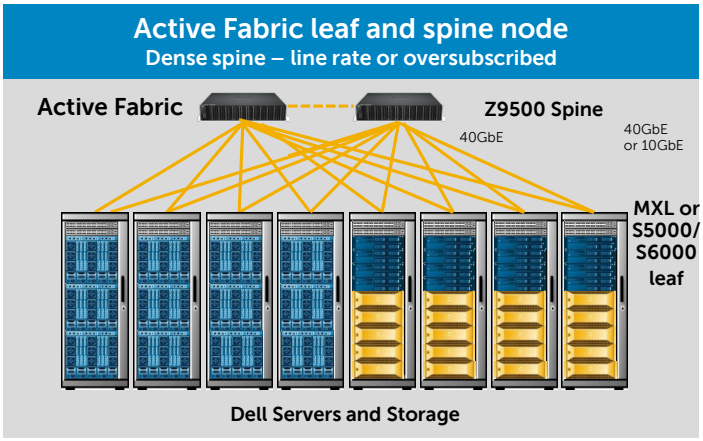
Simplify data center infrastructure

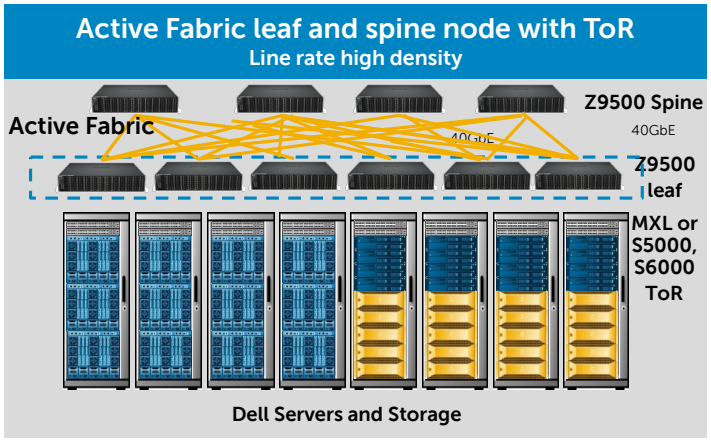
Leverage the high port densities of the Z9500 to consolidate networking functions and end-of-row with blade server systems. The Z9500 also simplifies manageability by reducing the number of devices as well as through easy cable routing via the cable management kit.



Cable management
New cable management kit for easy cable routing

Simplified data center infrastructure





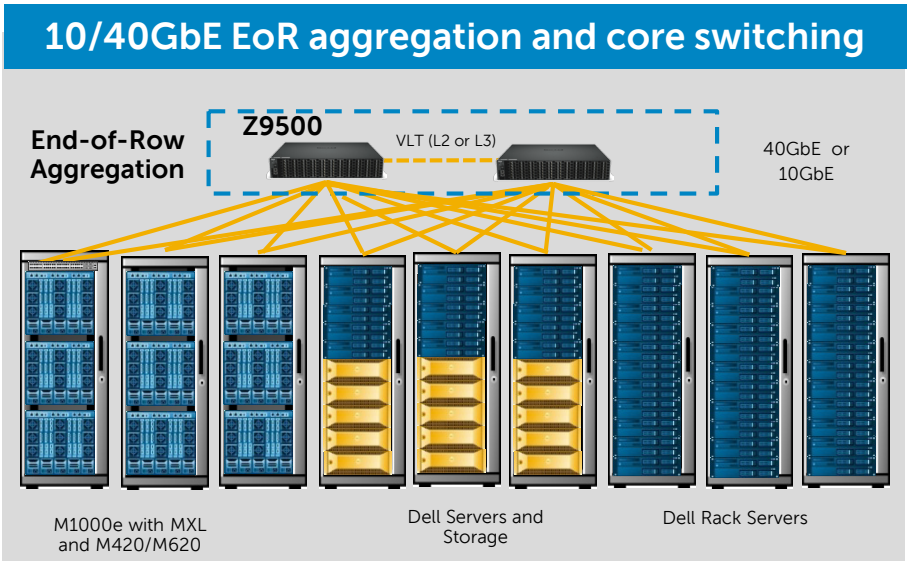
Accelerate data center infrastructure

The Z9500 can be deployed as a leaf and spine node in an Active Fabric configuration for high-performance, low-latency fabric switching. Accelerate east-web traffic and optimize application performance in scenarios where a 1:1 design is not required.

High-performance Active Fabric

Leverage the high port density of the Z9500 to consolidate network functions at end-of-row. Enable massively scalable architectures with 40GbE interconnects inside the fabric.

Collapsed leaf/spine

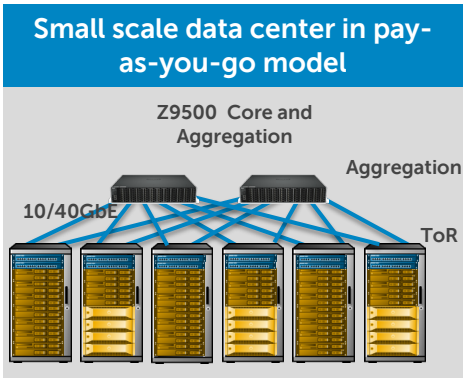


Simplify data center infrastructure

The Z9500 allows spine and leaf to be compressed into a highly dense fabric option. High port density enables the consolidation of end-of-row networking functions (such as attach) connected to the highly available fabric rather than a single end-of-row device. Management is simplified through the reduction of devices while maintaining full HA redundant performance.

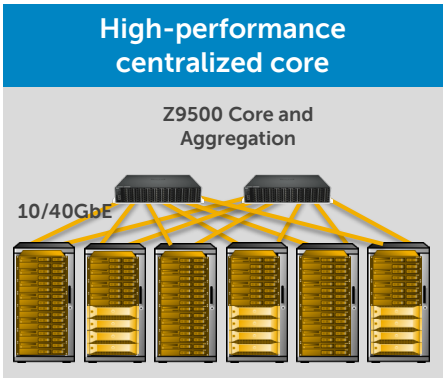
Although pictured, Dell switching/routing support is not restricted to Dell Server products.

Scalable Active Fabrics



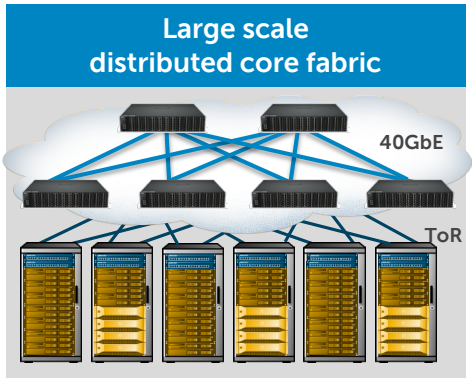
Micro scale fabric

The Z9500's pay-as-you-go* licensing model (36, 84 pork SKU) allows you to build fabrics for small data centers and increase fabric capacity as demand grows.



Macro scale fabric

The high port density of the Z9500 enables you to build large L2 domans for high-performance computing, enabling more dense, energy-efficient, low-latency deployment.



Hyperscale fabric

The high port density of the Z9500 also allows the consolidation of networking functions at the end-of-row, enabling massible scalable architectures with 40GbE interconnects inside the fabric.

* Post RTS SW release

Specifications: Z9500 high-performance 10/40GbE fabric switch

Dell SKU description

Z9500
Z9500, 36-port* 40GbE QSFP+ ports, redundant AC PS, fan subsys, w/airflow from I/O PNL to PS PNL (TAA certified)
Z9500, 84-port* 40GbE QSFP+ ports, redundant AC PS, fan subsys, w/airflow from I/O PNL to PS PNL (TAA certified
Z9500, 132-port 40GbE QSFP+ ports, redundant AC PS, fan subsys, w/airflow from I/O PNL to PS PNL (TAA certified)

Spare power supply
Z9500, AC power supply, I/O panel to PSU airflow

Fans
Z9500 fan module, I/O panel to PSU airflow

Optics
Transceiver, QSFP+, 40GbE, SR4 Optics, 850nm wavelength, 100–150M reach on OM3/OM4
Transceiver, QSFP+, 40GbE, eSR4 Optics, 850nm wavelength, 300–400M reach on OM3/OM4
Transceiver, QSFP+, 40GbE, PSM4 optics 1490nm, 1m, 5m, 15m

Cables
Cable, 40GbE QSFP+, active fiber optic, 10M and 50M
Cable, 40GbE QSFP+, direct attach cable, for 0.5M, 1M, 3M, 5M, 7M
Cable, 40GbE MTP to 4xLC 5M optical breakout cable (optics not included)
Cable, 40GbE QSFP+ to 4xSFP+ 5M direct attach breakout cable
Cable, 40GbE to 1GbE RJ45 10/100/1000 copper
Breakout box, 16QSFP to 64xSFP+ 1U*
Breakout box, 12QSFP to 48xSFP+ 1U

Cable management
Z9500 Cable Breakout Kit (Z9500MTP) to LC (1RU 48 or 64 port LC)
Z9500 Cable Management Kit*

Software
Software, Dell Networking Operating System Software, Z9500
Auto Fan speed control based on temperature
Note: In-field change of airflow direction not supported.

Physical

132 line-rate 40GbE QSFP+ ports
1 RJ45 console/management port with RS232 signaling
Size: 3RU, 5.25" h x 17.08" w x 34" d
Weight: 122 lbs
Power supply: 200–240V AC 50/60Hz
Max. power consumption: 3100 watts
Typ. power consumption: 2200 watts
Max. operating specifications:
Operating temperature: 32° to 104°F (0° to 40°C)
Operating humidity: 10 to 85% (RH), non-condensing
Max. non-operating specifications:
Storage temperature: –40° to 158°F (–40° to 70°C)
Storage humidity: 5 to 95% (RH), non-condensing
ReadyRails rack mounting system, no tools required

Redundancy

Hot-swappable redundant power
Hot-swappable redundant fans

Performance

MAC addresses:	160K
ARP table	48K
IPv4 routes:	16K
IPv6 hosts:	24K
IPv6 routes:	8K
Multicast hosts:	8K
Switching I/O bandwidth:	10.4Tbps (full-duplex)
Link aggregation:	16 links per group, 128 groups
Layer 2 VLANs:	4K
MSTP:	64 instances
Line-rate Layer 2 switching:	All protocols, including IPv4 and IPv6
Line-rate Layer 3 routing:	IPv4 and IPv6
LAG load balancing:	Based on Layer 2, IPv4 or IPv6 headers
Latency:	600 ns to 2us
Packet buffer memory:	204MB
CPU memory:	4GB
QOS data queues:	8
QOS control queues:	12
QOS:	Default 768 entries scalable to 2.5K per I/O slot
Ingress ACL:	2.5K
Egress ACL:	1K

IEEE compliance

802.1AB LLDP
802.1D Bridging, STP
802.1p L2 Prioritization
802.1Q VLAN Tagging, Double VLAN Tagging, GVRP
802.1Qbb PFC
802.1Qaz ETS
802.1s MSTP
802.1w RSTP
802.1X Network Access Control
802.3ab Gigabit Ethernet (1000BASE-T)
802.3ac Frame Extensions for VLAN Tagging
802.3ad Link Aggregation with LACP
802.3ae 10 Gigabit Ethernet (10GBASE-X)
802.3ba 40 Gigabit Ethernet (40GBASE-SR4, 40GBASE-CR4, 40GBase-LR4) on optical ports
802.3u Fast Ethernet (100BASE-TX) on mgmt ports
802.3x Flow Control
802.3z Gigabit Ethernet (1000BASE-X)
ANSI/TIA-1057 LLDP-MED
Force10 PVST+
MTU 12,000 bytes

RFC and I-D compliance

General Internet protocols

768 UDP
793 TCP
854 Telnet
959 FTP

General IPv4 protocols

791 IPv4
792 ICMP
826 ARP
1027 Proxy ARP
1035 DNS (client)
1042 Ethernet Transmission
1305 NTPv3
1519 CIDR
1542 BOOTP (relay) (this was removed from DHCP Server)
DHCP Snooping

General IPv6 protocols

1981 Path MTU Discovery (partial)
2460 IPv6
2461 Neighbor Discovery (partial)
IPv6 management features (telnet, FTP, TACACS, RADIUS, SSH, NTP)
2462 Stateless Address Auto-configuration (partial)

RIP

1058 RIPv1
2453 RIPv2

OSPF

1587 NSSA
2154 MD5
2328 OSPFv2
2370 Opaque LSA

BGP

1997 Communities
2385 MD5
2545 BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing
2439 Route Flap Damping
2796 Route Reflection
2842 Capabilities
2858 Multiprotocol Extensions
2918 Route Refresh
3065 Confederations
4360 Extended Communities
4893 4-byte ASN
5396 4-byte ASN representations
draft-ietf-idr-bgp4-20 BGPv4
draft-michaelson-4byte-as-representation-05
4-byte ASN Representation (partial)
draft-ietf-idr-add-paths-04.txt ADD PATH

Multicast

1112 IGMPv1
2236 IGMPv2
3376 IGMPv3
MSDP
draft-ietf-pim-sm-v2-new-05 PIM-SM

Network management

1155 SMIv1
1157 SNMPv1
1212 Concise MIB Definitions
1215 SNMP Traps
1493 Bridges MIB
1850 OSPFv2 MIB
1901 Community-based SNMPv2
2011 IP MIB
2012 TCP MIB
2013 UDP MIB
2096 IP Forwarding Table MIB
2570 SNMPv3
2571 Management Frameworks
2572 Message Processing and Dispatching
2576 Coexistence Between SNMPv1/v2/v3
2578 SMIv2
2579 Textual Conventions for SMIv2
2580 Conformance Statements for SMIv2
2618 RADIUS Authentication MIB
2665 Ethernet-like Interfaces MIB
2674 Extended Bridge MIB
2787 VRRP MIB
2819 RMON MIB (groups 1, 2, 3, 9)
2863 Interfaces MIB
2865 RADIUS
3273 RMON High Capacity MIB
3416 SNMPv2
3418 SNMP MIB
3434 RMON High Capacity Alarm MIB
3580 802.1X with RADIUS
4133 Entity MIB
5060 PIM MIB
ANSI/TIA-1057 LLDP-MED MIB
Dell_ITA.Rev_1_1 MIB
draft-grant-tacacs-02 TACACS+
draft-ietf-idr-bgp4-mib-06 BGP MIBv1
IEEE 802.1AB LLDP MIB
IEEE 802.1AB LLDP DOT1 MIB
IEEE 802.1AB LLDP DOT3 MIB
sFlow.org sFlowv5
sFlow.org sFlowv5 MIB (version 1.3)
SSHv2 RFC 4250, 4251, 4252, 4253, 4254
FORCE10-BGP4-V2-MIB Force10 BGP MIB (draft-ietf-idr-bgp4-mibv2-05)
FORCE10-IF-EXTENSION-MIB
FORCE10-LINKAGG-MIB
FORCE10-COPY-CONFIG-MIB
FORCE10-PRODUCTS-MIB
FORCE10-SS-CHASSIS-MIB
FORCE10-SMI
FORCE10-TC-MIB
FORCE10-TRAP-ALARM-MIB
FORCE10-FORWARDINGPLANE-STATS-MIB

Regulatory compliance

Safety

UL/CSA 60950-1, Second Edition
EN 60950-1, Second Edition
IEC 60950-1, Second Edition Including all National Deviations and Group Differences
EN 60825-1 Safety of Laser Products Part 1: Equipment Classification Requirements and User's Guide
EN 60825-2 Safety of Laser Products Part 2: Safety of Optical Fibre Communication Systems
FDA Regulation 21 CFR 1040.10 and 1040.11

Emissions

Australia/New Zealand: AS/NZS CISPR 22: 2006, Class A
Canada: ICES-003, Issue-4, Class A
Europe: EN 55022: 2006+A1:2007 (CISPR 22: 2006), Class A
Japan: VCCI V3/2009 Class A
USA: FCC CFR 47 Part 15,Subpart B:2011, ClassA

Immunity

EN 300 386 V1.4.1:2008 EMC for Network Equipment
EN 55024: 1998 + A1: 2001 + A2: 2003
EN 61000-3-2: Harmonic Current Emissions
EN 61000-3-3: Voltage Fluctuations and Flicker
EN 61000-4-2: ESD
EN 61000-4-3: Radiated Immunity
EN 61000-4-4: EFT
EN 61000-4-5: Surge
EN 61000-4-6: Low Frequency Conducted Immunity

RoHS

All Z-Series components are EU RoHS compliant.

Certifications

TAA (Trade Agreement Act) compliant models also available.

* Post RTS SW release

Learn More at Dell.com/Networking.

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